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Observations of Phenomena of Jupiter's Satellites with the 8-inch Equatorial of the Windsor Observatory, New South Wales, in the Year 1897. By John Tebbutt.

Day of Obs.	Satellite.	Phenomenon.	Phase.	Mag. Power.	G.M.T. of Observation.			Mean Time of *N. Almanac.*		
1897.					h	m	s	h	m	s
Feb. 22	I.	Tr. Egr.	Bisection	70	23	57	2	24	0	0
23	I.	,,	Ext. contact	,,	0	2	7			
Mar. 8	III.	Tr. Ingr.	Ext. contact	,,	23	35	20			
8	III.	,,	Bisection	,,	23	39	14	23	40	0
8	III.	,,	Int. contact	,,	23	43	9			
25	I.	Ecl. R.	First seen	,,	23	11	59	23	12	11
25	I.	,,	Full brightness	,,	23	15	0			
27	II.	Occ. D.	First contact	,,	22	47	32			
27	II.	,,	Bisection	,,	22	51	7	22	53	0
27	II.	,,	Last seen	,,	22	53	51			
30	IV.	Occ. R.	Bisection	,,	22	54	24	22	56	0
30	IV.	,,	Last contact	,,	23	1	23			
Apr. 1	I.	Occ. D.	First contact	,,	21	55	24			
1	I.	,,	Bisection	,,	21	58	59	22	0	0
1	I.	,,	Last seen	,,	22	1	18			
5	II.	Tr. Egr.	Int. contact	,,	22	8	36			
5	II.	,,	Bisection	,,	22	12	20	22	12	0
5	II.	,,	Ext. contact	,,	22	15	45			
9	I.	,,	Int. contact	,,	23	23	6			
9	I.	,,	Bisection	,,	23	26	11	23	27	0
9	I.	,,	Ext. contact	,,	23	29	25			
16	IV.	Ecl. D.	Began to fade	,,	20	7	25			
16	IV.	,,	Last seen	,,	20	15	46	20	15	27
16	I.	Tr. Ingr.	Ext. contact	,,	22	54	57			
16	I.	,,	Bisection	,,	22	56	51	22	56	0
16	I.	,,	Int. contact	,,	22	59	6			
17	I.	Occ. D.	First contact	,,	19	57	50			
17	I.	,,	Bisection	,,	20	1	0	20	4	0
17	I.	,,	Last seen	,,	20	3	59			
17	I.	Ecl. R.	First seen	,,	23	24	45	23	24	58
17	I.	,,	Full brightness	,,	23	28	35			

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Day of Obs.	Satellite.	Phenomenon.	Phase.	Mag. Power.	G.M.T. of Observation.	Mean Time of *N. Almanac*,
1897.					h m s	h m s
Apr. 26	I.	Ecl. R.	First seen	70	19 48 23	19 48 34
26	I.	,,	Full brightness	,,	19 50 54	
28	II.	Occ. D.	First contact	138	21 40 8	
28	II.	,,	Bisection	,,	21 43 23	21 43 0
28	II.	,,	Last seen	,,	21 45 28	
May 1	III.	Ecl. R.	First seen	,,	22 15 36	22 16 2
1	I.	Occ. D.	First contact	131	23 43 19	
1	I.	,,	Bisection	,,	23 45 58	23 46 0
1	I.	,,	Last seen	,,	23 47 38	
2	I.	Tr. Ingr.	Ext. contact	,,	21 6 39	
2	I.	,,	Bisection	,,	21 9 4	21 6 0
2	I.	,,	Int. contact	,,	21 11 19	
2	I.	Tr. Egr.	Int. contact	,,	23 21 37	
2	I.	,,	Bisection	,,	23 24 6	23 25 0
2	I.	,,	Ext. contact	,,	23 27 1	
2	Shd. I.	Transit	On cent. merid.	,,	23 16 43	
3	I.	Ecl. R.	First seen	175	21 43 31	21 43 34
8	III.	Occ. R.	Last contact	132	21 18 56	21 22 0
8	III.	Ecl. D.	Last seen	74	22 59 33	22 56 0
10	I.	Occ. D.	First contact	168	20 6 8	
10	I.	,,	Bisection	,,	20 8 28	20 7 0
10	I.	,,	Last seen	,,	20 9 38	
14	II.	Tr. Ingr.	Ext. contact	,,	20 52 35	
14	II.	,,	Bisection	,,	20 55 30	20 56 0
14	II.	,,	Int. contact	,,	20 58 44	
15	III.	Occ. D.	First contact	132	21 37 52	
15	III.	,,	Bisection	,,	21 41 16	21 40 0
15	III.	,,	Last seen	,,	21 44 40	
16	II.	Ecl. R.	First seen	74	21 22 20	21 22 2
16	II.	,,	Full brightness	,,	21 26 36	
17	I.	Occ. D.	First contact	168	21 58 14	
17	I.	,,	Bisection	,,	22 1 4	22 1 0
17	I.	,,	Last seen	,,	22 2 33	
25	I.	Tr. Ingr.	Ext. contact	,,	21 16 11	
25	I.	,,	Bisection	,,	21 18 16	21 16 0
25	I.	,,	Int. contact	,,	21 20 45	
26	I.	Ecl. R.	First seen	74	21 57 40	21 57 44

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Day of Obs.	Satellite.	Phenomenon.	Phase.	Mag. Power.	G.M.T. of Observation.	Mean Time of *N. Almanac.*
1897.					h m s	h m s
June 26	I.	Tr. Egr.	Int. contact	168	20 16 9	
26	I.	,,	Bisection	,,	20 20 3	20 22 0
26	I.	,,	Ext. contact	,,	20 22 53	
July 1	II.	Occ. D.	First contact	,,	21 14 28	
1	II.	,,	Bisection	,,	21 17 3	21 16 0
1	II.	,,	Last seen	,,	21 19 42	
4	I.	Ecl. R.	First seen	74	20 31 19	20 31 1
19	II.	,,	First seen	,,	20 33 16	20 32 44
19	II.	,,	Full brightness	,,	20 35 52	

Notes.

February 22–23.—Definition pretty good.

March 8.—Good definition.

March 25.—Sky beautifully clear, and images steady and well defined.

March 27.—Good definition.

March 30.—Images steady and fairly well defined.

April 1.—Good definition.

April 5.—Definition pretty good.

April 9.—Definition pretty good, but first phase unsatisfactory.

April 16.—The time of final disappearance doubtful to a second or two in consequence of the very slow fading of the satellite; the definition was good. The definition was also good at the ingress. Clouds prevented an observation of the reappearance from eclipse.

April 17.—Images very tremulous and badly defined, particularly at the last phase of the occultation. Definition pretty good at the eclipse, but full Moon present. In observing the first phase of the eclipse the planet was hidden by a bar of the micrometer eyepiece.

April 26.—Beautifully clear and definition good, but the twilight had scarcely disappeared. The first phase was observed as on the 17th. The square bar micrometer, which was in adjustment for the observation of Comet I., 1897 (Perrine), was employed from February 22 to April 26.

April 28.—Good definition.

May 1.—Definition good for both phenomena, except at the last phase of the occultation. Sky beautifully clear.

May 2.—Definition pretty good for the ingress and good for the egress. The transit of the shadow was observed by estimation only.

May 3.—Good definition.

May 8.—Definition pretty good for the occultation phase. For the eclipse the sky was beautifully clear and the definition good, but the Moon was present.

May 10.—Definition pretty good, but the second phase was observed late.

May 14.—Definition bad and images tremulous.

May 15.—Images pretty steady and well defined.

May 16.—Definition pretty good, but images rather tremulous, and the full Moon present.

May 17.—Definition good at first two phases, but bad at the last phase.

May 25.—Definition bad and images tremulous.

May 26.—Light clouds occasionally passing over the planet, but at the critical time it shone clear and bright.

June 26.—Definition pretty good.

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July 1.—Bad definition; last phase extremely difficult to observe.

July 4.—Sky beautifully clear and Moon not far from planet. The images were greatly blurred and the observation was very unsatisfactory.

July 19.—Sky beautifully clear, but the images were unsteady and badly defined.

Except where otherwise stated, an occulting bar was not employed in the eclipse observations. The times given are the Windsor mean times of observation diminished by 10 hrs. 3 mins. 20·51 secs., and extend to the nearest second. The observations of full brightness in the eclipses are at the best only rough approximations. In determining these times the increasing light of the satellite was repeatedly compared with the other visible satellites.

Private Observatory, Windsor, N.S. Wales:
1898 *April* 18.

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Ephemeris for Physical Observations of

Greenwich Noon.	P.	L−O.	B.	Λ−L.	*B.*	Q.	E.	Light Time.
1898.	°	°	°	°	°	°	°	m
June 27	321·16	143·13	−14·98	−35·17	−24·13	252·22	34·29	14·96
29	321·20	144·51	14·45	35·22	23·96	252·67	34·49	14·89
July 1	321·26	145·88	13·92	35·26	23·78	253·13	34·70	14·83
3	321·34	147·25	13·39	35·31	23·59	253·59	34·91	14·76
5	321·45	148·60	12·85	35·35	23·40	254·05	35·12	14·69
7	321·58	149·94	−12·31	−35·39	−23·19	254·51	35·32	14·61
9	321·74	151·28	11·76	35·44	22·97	254·98	35·53	14·54
11	321·92	152·60	11·21	35·47	22·74	255·47	35·73	14·47
13	322·13	153·92	10·66	35·50	22·50	255·96	35·93	14·40
15	322·36	155·23	10·10	35·53	22·25	256·46	36·12	14·33
17	322·61	156·53	−9·54	−35·56	−21·99	256·97	36·31	14·25
19	322·88	157·81	8·98	35·59	21·72	257·49	36·50	14·18
21	323·16	159·08	8·41	35·61	21·44	258·01	36·70	14·11
23	323·46	160·35	7·84	35·64	21·16	258·54	36·89	14·03
25	323·79	161·61	7·27	35·67	20·87	259·08	37·08	13·96
27	324·14	162·86	−6·70	−35·71	−20·57	259·62	37·26	13·88
29	324·51	164·10	6·14	35·74	20·26	260·16	37·43	13·80
31	324·90	165·33	5·58	35·77	19·94	260·71	37·61	13·71
Aug. 2	325·31	166·56	5·01	35·80	19·62	261·26	37·78	13·63
4	325·73	167·78	4·44	35·83	19·29	261·82	37·95	13·55
6	326·17	168·98	−3·87	−35·86	−18·96	262·38	38·13	13·47
8	326·63	170·18	3·31	35·89	18·62	262·94	38·29	13·39
10	327·10	171·38	2·75	35·92	18·27	263·50	38·45	13·30
12	327·58	172·57	2·19	35·95	17·91	264·06	38·61	13·21
14	328·08	173·76	1·63	35·99	17·55	264·62	38·76	13·12
16	328·60	174·94	−1·07	−36·03	−17·19	265·18	38·91	13·03
18	329·12	176·11	−0·52	36·07	16·82	265·74	39·06	12·94
20	329·65	177·27	+0·03	36·11	16·45	266·30	39·20	12·85
22	330·20	178·42	0·57	36·15	16·07	266·86	39·34	12·76
24	330·76	179·56	1·11	36·18	15·69	267·42	39·47	12·66
26	331·32	180·69	1·64	36·21	15·30	267·98	39·60	12·57
28	331·89	181·82	2·17	36·25	14·91	268·53	39·72	12·47
30	332·47	182·94	+2·70	−36·29	−14·51	269·08	39·84	12·38